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July 8, 2002

**VIA ELECTRONIC FILING**

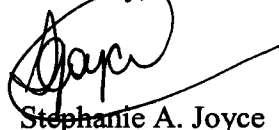
Marlene H. Dortch  
Secretary  
Federal Communications Commission  
445 12th Street, S.W.  
Washington, D.C. 20554

Re: Initial Comments, *Spectrum Policy Taskforce Request for Comment*, ET  
Docket No. 02-135

Dear Ms. Dortch:

Attached hereto are the Initial Comments of Loea Communications Corporation in the above-captioned docket. Please do not hesitate to contact me with any questions or concerns regarding this filing: 202.955.9890.

Sincerely,



Stephanie A. Joyce

Counsel for Loea Communications Corporation

Attachment

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of	)	
	)	ET Docket No. 02-135
Spectrum Policy Taskforce	)	
Request for Comment	)	

**COMMENTS OF LOEA COMMUNICATIONS CORPORATION**

Loea Communications Corporation (“Loea”), by its attorneys, hereby provides comment in response to the Public Notice released by the Spectrum Task Force of the Office of Engineering and Technology (“OET”).<sup>1</sup> Loea focuses these comments on the spectrum bands at 71.0 to 76.0 and 81.0 to 86.0 Gigahertz (“GHz”), known collectively as the Upper Millimeter Wave (“UMW”) spectrum, in its discussion of particular policies under consideration in this proceeding. Specifically, Loea explains why OET’s approach to allocation and interference protection for UMW spectrum should be more streamlined than the existing regulatory framework for other spectrum bands that are prone to scarcity and harmful interference.

**BACKGROUND**

Loea is a subsidiary of Trex Enterprises Corporation (“Trex”) that is devoted to developing and deploying wireless technologies for use in Trex’s innovative communications technologies. As the pioneer in adapting UMW spectrum for commercial use, Loea has participated actively in the Commission’s consideration of rules to allocate and regulate these bands.<sup>2</sup> Although Loea intends to file detailed comments in the upcoming proceeding regarding

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<sup>1</sup> DA 02-1311, *Spectrum Policy Task Force Seeks Public Comment on Issues Related to Commission’s Spectrum Policies*, ET Docket No. 02-135 (June 6, 2002) (“Notice”).

<sup>2</sup> The Commission is seeking notice and comment on proposed service rules for UMW spectrum as a result of Loea’s Petition for Rulemaking filed September 10, 2001 (“Loea

the service rules for the 71-76, 81-86 and 92-95 GHz bands, it responds herein to certain issues raised in the *Notice* that are of particular import to UMW technologies.

Among the technologies that Loea has developed is a high-speed, high-resolution data transmission solution capable of bringing 1.25 Gigabits-per-second (“Gbps”) throughput over a highly directional, 5 milliwatt (“mW”) beam. We call this a “pencil beam” because it is only 0.36 degrees wide. This technology is ideally suited to high-speed Internet access service, and is especially needed in areas in which laying sufficient fiber optic transport capacity is impractical, namely urban and rural areas. In approving UMW spectrum for commercial use, the Commission has enabled carriers like Trex to bridge the digital divide to a degree that contemporary wireline technologies have been unable to achieve.

Loea tested its pencil beam technology in July 2001 in Hawaii, with striking results: a 5 mW transmitter was able to transmit to a receiver 1.7 miles away, with a terminating radial footprint of only 28 feet and 240 Watts ERP in delivery.<sup>3</sup> A second dish operating within that 28-foot radius was able to use the same frequency spectrum without interference, needing only a slight directional adjustment. Loea has thus far achieved 1.25 Gbps of throughput capacity, but is developing the technology to provide 12.5 Gbps throughput to meet the next “10-Gigabit Ethernet” standard for connectivity.

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Petition”). *FCC Initiates Proceeding to Promote Commercial Development of Spectrum in the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands* (June 13, 2002).

<sup>3</sup> A full description of the technical characteristics of 71.0 to 76.0 GHz and 81.0 to 86.0 GHz spectrum appears in the Loea Petition at pages 3-5, and in the paper by John A. Lovberg, *Fixed Point-to-Point Operations in the 71.0-76 GHz and 81.0-86 GHz Bands*, attached as Appendix A to the Loea Petition.

Because of its relative ease of deployment and fully wireless configuration, this UMW technology could well be a solution for last-mile connectivity in underserved rural and inner-city urban areas.<sup>4</sup>

**I. PENCIL BEAM TECHNOLOGIES DEPLOYED IN UMW SPECTRUM HAVE UNIQUE PROPAGATION CHARACTERISTICS AND THEREFORE CARRY ONLY A *DE MINIMIS* RISK OF HARMFUL INTERFERENCE**

Spectrum interference appears to be chief concern for OET in this proceeding. The *Notice* includes several items related to protecting services from harmful interference as “the radio spectrum is becoming increasingly congested.” *Notice* at 3. OET should, then, view the UMW spectrum as a relief from these issues, as it carries at most a *de minimis* risk of congestion and interference.

OET seeks comment on whether “new” definitions of “interference” and “harmful interference” are necessary as increasing amounts of radio spectrum become commercialized. *Notice* at 4, item 7. Presumably, the relative wealth of services now deployed over wireless technologies has resulted in greater instances of interference, as well as new types of interactions that may be deemed “harmful interference.” This will not be the case with technologies deployed over UMW spectrum, and thus OET should not view this spectrum as requiring the kind of regulatory revamping that lower frequency spectrum may need.

The pencil-beam technology that Loea seeks to deploy over UMW spectrum enables very narrow transmission paths. Using a point-to-point configuration, this technology creates highly directional beams that deliver high ERP despite using little transmitter power. This type of transmission propagates in such a way as to remain spatially small — our experiment yielded a

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<sup>4</sup> See A. Daniel Kelly, HAI Consulting, *Economically Efficient Licensing of the Millimeter Wave Band* at 5-7, Loea Petition at Appendix B (discussing the positive effect that high-speed connectivity over this spectrum will have on unmet consumer demand).

28-foot radial footprint at 1.7 miles — and thus easily avoidable by other UMW transmissions. As such, the risk of two such transmissions interfering with each other is highly unlikely.

Further, pencil-beam transmissions can interfere with each other only if both the transceiver and receiver sites lie on the same path. Were this type of deployment to occur, the problem is easy to resolve. Loea’s transmitters, which resemble satellite dishes, are a mere two feet in diameter and thus highly mobile — in the event that transmission paths coincide, the transmitters can be adjusted easily. For this reason, OET’s question whether “more explicit protections from harmful interference of incumbent users” are required does not apply to this spectrum. *Notice* at 4, item 9.

UMW spectrum does not resolve interference issues prevalent in lower-frequency spectrum. Nor should it be subject to the interference protection framework that OET is now formulating. As Loea has shown, any inadvertent interfering configuration at this frequency is easily resolved through minimal coordination between carriers. In fact, the UMW spectrum may be, of all commercial bands, the best spectrum in which to adopt “negotiated agreements, [or] mediation” to resolve any disputes. *Notice* at 4, item 15. A strict regulatory regime, however, would be unnecessary. Loea urges OET, and the Spectrum Policy Taskforce, to be cognizant of the particularly advantageous characteristics of UMW spectrum as an inappropriate forum for intrusive interference guidelines.

## **II. LOW INTERFERENCE RISK REMOVES THE SCARCITY PROBLEM FOR UMW SPECTRUM, MAKING CHANNELIZATION AND EXCLUSIVE LICENSES UNNECESSARY**

The *Notice* also seeks comment on the Commission’s spectrum allocation policy, and specifically whether “more market-oriented allocation” should be explored as a more prudent approach to licensing. *Notice* at 2. This inquiry is premised on the problem of scarcity that

pervades the commercialization of radio spectrum. Yet UMW technologies, as Loea has demonstrated, can accommodate a virtually unlimited number of carriers and services, and thus present no scarcity problem. For these reasons, OET need not devise any specific approach to allocation of UMW spectrum, but rather should consider a simple authorization process for potential users.

Because of the unique propagation characteristics of UMW technologies, a virtually limitless number of services and service providers can utilize UMW spectrum in any market, and indeed any town. Loea's Hawaii experiment demonstrates that several dishes can operate on the same frequency, in the very near vicinity, and can even intersect beams without transmission degradation. Simply put, *there is no risk of scarcity for UMW spectrum.*

Absent scarcity or the potential for interference, there is no need to channelize this spectrum. Even were the Commission to allocate the entire 10 GHz block to applications such as Loea's, any carrier could enter the market on this spectrum and operate a robust service. In fact, such allocation will be necessary to ensure that UMW carriers can meet the growing demand for data backhaul. The Commission could allocate the full 10 GHz and still invite as many carriers into the market as there are transmission paths. To subdivide the spectrum would only hinder the ability of carriers to achieve desired throughput capacity but will have no palliative effect whatever on interference — there is almost no risk of interference in the first instance.

In addition, the Commission need not award exclusive licenses for UMW spectrum. Where typically carriers must obtain the exclusive use of the spectrum in order to ensure robustness of service, the propagation characteristics of UMW spectrum obviate that need entirely. As such, there will be no scenario of mutual exclusivity for this spectrum, and thus an auction would not be necessary to ensure that the spectrum is used only by one party who values

it most. Though this spectrum undoubtedly has great value, it has no concomitant scarcity to warrant competitive bidding.

That is not to say, however, that Loea finds no role for the Commission in regulating the use of UMW spectrum. Forbearance from competitive bidding does not equate to forbearance from Commission oversight. As is true in any service, it is necessary that the Commission ensure that all carriers have the technical expertise to operate a common carrier service. In order to protect the public interest in this manner, the Commission could devise a streamlined, though mandatory, authorization process for UMW spectrum. This process could resemble the “short form” auction application, requiring carriers to state their proposed use for the spectrum and to demonstrate the quality of their service. In addition to preserving reliable common carriage over the nation’s spectrum, this relatively simple regulatory requirement would have two important results: providing assurance to potential investors and helping to raise customer confidence for UMW technology.

Granting formal Commission authorization to UMW carriers will demonstrate to customers that this technology is approved for service on a common carriage basis. For a new technology, this type of governmental imprimatur is extremely helpful. While Loea’s tests in Hawaii are themselves indicative of the reliability of UMW spectrum for high-speed data transmission, end users may be more assured of this fact if the Commission itself gave Loea and other qualified carriers formal authorization. In this age of rapidly changing communications media, this message would help ensure a smooth introduction of UMW to the public.

An authorization process would have a similar effect on the investment community. If potential investors were assured that the Commission required all carriers to be approved, and that approval meant that a carrier had met some minimum standard of expertise and quality, they

would be more apt to invest in UMW technology. This investment would go directly toward the development of services, creating the rapid growth of innovative, largely broadband, services. Thus, in adopting an authorization requirement for this spectrum, the Commission would help to fulfill its mandate to spur broadband deployment through its regulation of the public radio spectrum.



## CONCLUSION

For these reasons, Loea urges the Office of Engineering and Technology to take notice of the unique characteristics of "pencil-beam" Upper Millimeter Wave communications and technology when crafting a new framework for regulating the public spectrum. Specifically, OET should note the minimal risk of interference associated with UMW spectrum, such that interference protection rules and spectrum channelization are unnecessary to ensure that carriers may provide robust, quality broadband services to the public.

Respectfully submitted,

**LOEA COMMUNICATIONS CORPORATION**

By:



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